

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
27 January 2005 (27.01.2005)

PCT

(10) International Publication Number  
**WO 2005/007504 A1**

(51) International Patent Classification<sup>7</sup>: **B63H 23/30**,  
23/06, F16H 3/091, 3/10

[AU/AU]; Unit 9/6 Anella Avenue, Castle Hill, NSW 2154 (AU).

(21) International Application Number:  
PCT/AU2004/000978

(74) Agent: **F B RICE & CO**; 605 Darling Street, Balmain, NSW 2041 (AU).

(22) International Filing Date: 21 July 2004 (21.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003903788 22 July 2003 (22.07.2003) AU  
60/507,005 28 September 2003 (28.09.2003) US  
2004901167 5 March 2004 (05.03.2004) AU

(71) Applicant (for all designated States except US): **NAU-TITECH PTY LTD** [AU/AU]; Unit 9/6 Anella Avenue, Castle Hill, NSW 2154 (AU).

(72) Inventors; and

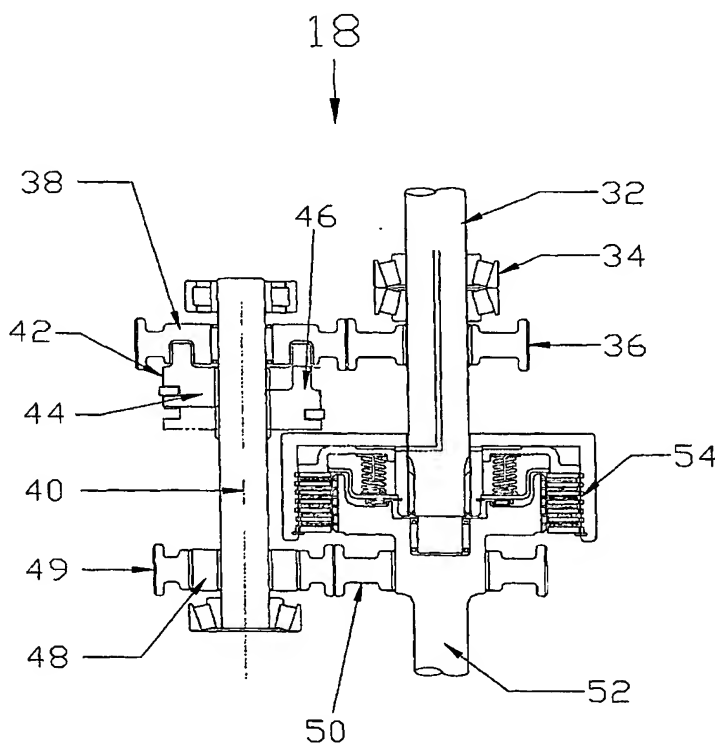
(75) Inventors/Applicants (for US only): **MOWBRAY, Graham** [AU/AU]; Unit 9/6 Anella Avenue, Castle Hill, NSW 2154 (AU). **TAMBA, Ric** [AU/AU]; Unit 9/6 Anella Avenue, Castle Hill, NSW 2154 (AU). **TAPPER, Steve**

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: **SINGLE CLUTCH TRANSMISSION**



(57) Abstract: A two speed transmission includes an input shaft; a lay shaft spaced from the input shaft; a first gear train connecting the input shaft to the lay shaft; a second gear train connecting the lay shaft to an output shaft the gear train including a one way clutch or similar; and a clutch for engaging the input shaft with the output shaft. The transmission is arranged such that when the output shaft is disengaged from the input shaft power is transmitted to the output shaft via the first and second gear trains and the lay shaft. When the clutch is disengaged, power is transmitted from the input shaft via the gear trains and the lay shaft via the one way clutch to the output shaft which typically provides first or low gear for use in low speed manoeuvring or where greater torque is required. With the clutch engaged, power may be transmitted from the input shaft directly to the output shaft to provide a second gear for when the watercraft is cruising. This transmission system has the advantage of being extremely compact and since, it requires only a single clutch, provides reduced drag compared with transmission systems incorporating more than one clutch. Advantageously, the default for the transmission has the one way clutch or similar in the first or lower gear, with the clutch normally on, so that if the system fails, it is always possible for the boat owner to get the boat home albeit at a slower speed.

WO 2005/007504 A1



**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*